

**A.2.36 AOC 23****Description**

AOC 23 was first identified in 1996 while Chevron was installing foundations for above ground piping near Tank 327 in the North Field. Oily soil and other evidence of petroleum impacts were observed on ponded groundwater in excavation pits associated with this construction project.

As shown on Figure A.2.32 and summarized on Table A.2.32, six borings and 14 soil samples have been used to characterize AOC 23. Additionally, borings from adjacent areas (e.g., SWMU 41, SWMU 18 and Phase II OWSS Investigation Area NF4) are included on Table A.2.32 for delineation purposes.

A total of six soil borings were installed around Tank 327 during the Full RFI (S0795, S0796, and S0797) and second iteration sampling (S1018, S1019, and S1020) as depicted on Figure A.2.32 to determine whether a release has occurred. Ten soil samples were collected from the surficial soils, fill material and native material and analyzed for TCL VOCs and SVOCs, and TAL metals, and four samples were analyzed for TOL as summarized on Table A.2.32 to provide additional data for source characterization. One sample was also analyzed for SPLP metals and physical characteristics<sup>1</sup>.

**Soils**

The following table summarizes the number of samples where the soil delineation criteria were exceeded within AOC 23:

| <b>Constituents of Concern</b> | <b>Surface Soils<br/>(0 to 2 ft)<br/>(5 Samples)</b> | <b>Fill Material<br/>(&gt;2 ft)<br/>(6 Samples)</b> | <b>Native Soils<br/>(3 Samples)</b> | <b>Totals<br/>(14 Samples)</b> |
|--------------------------------|--|---|-------------------------------------|--------------------------------|
| Benzene                        | 0/3  | 2/4   | 0/3                                 | 2/10                           |
| Other VOCs                     | 0/3  | 1/4   | 0/3                                 | 1/10                           |
| Benzo(a)pyrene                 | 0/3  | 0/4   | 0/3                                 | 0/10                           |
| Other SVOCs                    | 0/3  | 0/4   | 0/3                                 | 0/10                           |
| Lead                           | 1/3  | 2/4   | 0/3                                 | 3/10                           |
| Arsenic                        | 1/3  | 3/4   | 0/3                                 | 4/10                           |
| Other TAL Metals <sup>a</sup>  | 1/3  | 1/4   | 0/3                                 | 1/10                           |
| TOL/TEL                        | 0/2  | 2/2   | 0/0                                 | 2/4                            |

<sup>a</sup>Totals do not include naturally occurring metal compounds in excess of the delineation criteria (Al, Ca, Fe, Mg, Mn, K and Na).

<sup>1</sup>Physical characteristics specified in Appendix A, Task IV of Module III of the HWSA Permit included saturated and unsaturated permeability tests, moisture content, relative permeability, bulk density, porosity, soil sorptive capacity, CEC, TOC, pH, Eh and grain size distribution.

**Surface Soils (0 to 2 feet bgs)**

No notable staining or elevated headspace readings were observed within the surface soils collected from AOC 23. However, antimony (47.7 mg/kg), arsenic (117 mg/kg), and lead (5,090 mg/kg) were detected above the applicable soil delineation criteria in one of the three surface soil samples (S0795A2). Arsenic (117 mg/kg) is within the normal range for soils, particularly glauconitic soils in the Coastal Plain (Sanders, 2003).

**Fill Materials (>2 feet bgs)**

The lithologic descriptions on the boring logs noted catalyst beads and evidence of petroleum-related impacts (e.g., odors, elevated PID readings, etc.) in the fill material. The thickness of the fill layer ranges from approximately four to seven feet.

As shown on the table above, benzene (2.26 and 2.07 mg/kg) was detected above the applicable soil delineation criterion in two samples (S0796B4 and S0795B3, respectively). Cyclohexane (180 mg/kg) was also detected above the applicable criterion in S0795B3. Benzene (1.5 mg/kg) was also detected in S1018B4, but this sample was collected from the saturated zone, so the IGWSCC (1 mg/kg) is not applicable, and the concentration is below the RDCSCC (3 mg/kg). Two samples (S0766B4 and S0795B3) contain lead (8,450 and 5,090 mg/kg) above the applicable soil delineation criteria. The two TOL samples (S01020C1 and S1019B4) collected during the second iteration of RFI sampling, contained TOL (91.9 and 55.3 mg/kg, respectively) above the applicable soil delineation criterion.

Arsenic (ranging from 31.5 to 117 mg/kg) was detected in three subsurface fill samples above the applicable soil delineation criterion. The arsenic concentrations (31.5 to 117 mg/kg) are within the normal range for soils, particularly glauconitic soils in the Coastal Plain (Sanders, 2003). Sample S0795B3 also contained antimony (228 mg/kg) above the applicable delineation criterion.

**Native Material**

A clay/peat layer underlies the fill material in this part of the Refinery. The clay/peat layer is approximately four to seven feet bgs. No COCs (with the exception of naturally-occurring iron) were detected above the applicable soil delineation criteria within the native soil at AOC 23. Therefore, the site-related soil impacts have been delineated vertically.

As discussed further in Section 6 of the RFI Report, lateral delineation of selected COCs has been completed on a site-wide basis for each Yard. The delineation of these COCs is depicted graphically on the figures provided in Section 6.

## Groundwater

Groundwater data from cross-gradient areas (Phase II OWSS Area NF4) such as H0441 indicate exceedances of VOCs (benzene at 8 µg/L and xylenes at 300 µg/L) and arsenic (8.81 µg/L). Further discussion of potential groundwater impacts in the vicinity of AOC 23 can be found in Section 8 of the RFI Report.

## Summary

AOC 23 is a confirmed TEL site based on the presence of benzene, lead, TOL and several other COCs at concentrations above their respective delineation criteria in the fill material at AOC 23. Therefore, impacted soils at AOC 23 will be included for further evaluation in the CMS. Potentially impacted groundwater in the vicinity of AOC 23 will be included in the site-wide groundwater evaluation in the CMS.